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The mediator role of learning capability and business innovativeness between total quality management and financial performance

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The concept of total quality management (TQM) has attracted many researchers from a variety of disciplines. In particular, the literature has addressed the impact of TQM on a firm's operations and performance. However, disparate perspectives on the relationship between TQM and a firm's financial performance have emerged. In this paper, we suggest an interconnected relationship among TQM, organisational learning capability (OLC), business innovativeness, and a firm's financial performance and propose that OLC and business innovativeness mediate the relationship between TQM and a firm's financial performance. By studying 193 firms in Turkey, we found that: (1) TQM affects OLC and a firm's business innovativeness, (2) OLC influences a firm's business innovativeness and (3) a firm's business innovativeness affects its financial performance. Also, we found that OLC and business innovativeness in a firm mediate the relationship between TQM and the firm's financial performance.

Keywords: total quality management; organisational learning capability; business innovativeness; financial performance

1. Introduction

It is widely recognised in the literature that firms adopting a quality-oriented strategy have achieved higher overall performance (Fuentes-Fuentes, Lloréns-Montes, and Albacete-Sáez 2007; Vanichchinchai and Igel 2011). However, some researchers have argued that total quality management (TQM) efforts alone are not sufficient for improving firms' performance in general, and their financial performance in particular (Zhang, Linderman, and Schroeder 2012). In this vein, researchers began to recognise that the relationship between TQM and firms' financial performance is contingent on other organisational factors (Hung et al. 2011). For example, there is growing consensus among researchers regarding the importance of business innovativeness and organisational learning capability (OLC) in the achievement of higher organisational performance in general (Yeung, Lai, and Yee 2007) and financial performance in particular (Hendricks and Singhal 2000). Also, the literature indicates that TQM practices enable the creation of an environment which supports business innovativeness (Martinez-Lorente, Dewhurst, and Dale 1999; Perdomo-Ortiz, Benito, and Galende 2009) and improves OLC (Li, Wang, and Liu 2011). However, to date only a few attempts have been made to analyse the mediating roles of OLC and business innovativeness in the relationship between TQM and firms' financial performance. Additionally, although studies have supported the notion that OLC promotes business innovativeness (Camison and Villar-Lopez 2011; Hung et al. 2011), which in turn promotes financial performance, there is little evidence regarding the relationship between OLC and business innovativeness specifically. Therefore, this paper aims to investigate the interconnected or interwoven relationships among TQM practices, OLC, business innovativeness and a firm's financial performance to extend the existing research on TQM, organisational capabilities and innovation by examining the nested interrelationships.

The paper proceeds in the following manner. In the background section, we present the literature highlighting TQM, OLC and business innovativeness as the theoretical framework. This is followed by the hypothesis development section where we develop related arguments concerning the conceptual model comprising the interrelationships between TQM, OLC, business innovativeness and financial performance. The research methodology is then introduced with a detailed explanation of the measures and sample. The results are then presented with a thorough description of the empirical analysis, including second-order confirmatory factor analysis (CFA), measure validity and reliability analyses using structural equation modelling (SEM). Finally, discussion and implications are presented along with limitations; the paper concludes with suggestions for future research.

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2. Background

TQM is a multi-dimensional construct evaluated as a strategic tool which extends beyond the reconstruction of quality standards, techniques and instruments; it is considered a systematic model of organisational behaviour and development (Ho, Duffy, and Shih 2001; Perdomo-Ortiz, Gonzalez-Benito, and Galende 2006). Indeed, TQM is a system approach which is an integral part of organisational strategy aimed at people-focused management featuring participation of all firm members and a culture of cooperation to create value for all stakeholders through continuous improvement (Dean and Evans 1994). To assess the degree of success in implementing TQM, researchers and institutions have established various quality standards and awards that set a framework to apply the TQM perspective in practice (Adebanjo 2001). For example, organisations adopt business excellence models, such as the European Foundation for Quality Management and Malcolm Baldrige National Quality Award, for the effective deployment and implementation of TQM practices (Sampaio, Saraiva, and Monteiro 2012). Although different researchers have adopted different practices or dimensions of TQM, in this paper, we undertake six – leadership, strategic planning, customer focus, information and analysis, people management and process management – by following the work of Samson and Terziovski (1999), Kristal, Huang, and Schroeder (2010), and Prajogo and Sohal (2006). *Leadership* reflects management's engagement, commitment and vision toward creating a quality-oriented and change strategy (Lakshman 2006). *Strategic planning* highlights the extent to which the organisation has comprehensive and structured planning regarding short- and long-term quality or business process objectives diffused throughout the firm and supported by both employees and managers (Prajogo and Sohal 2006). *Customer focus* is identified as an important element of production and delivery of products and services that fulfils customers' existing and projected needs and expectations (Dean and Evans 1994). *Information and analysis* refers to the effective performance measurement system and active competitive 'best practice' analysis among competitors within the organisational structure (Prajogo and Sohal 2006). *People management* indicates the incentive programmes, decentralisation of work decisions and employee empowerment (Perdomo-Ortiz, Benito, and Galende 2009). *Process management* focuses on the standardisation of processes to guarantee the reliability of planned tasks, resulting in organisational conformity, reduced ambiguity and decreased error due to repeated behaviour (Santos-Vijande and Álvarez-González 2007).

Although the TQM practices cited have positive relationships with firm performance (Flynn, Schroeder, and Sakakibara 1995) in general and firm financial performance in particular (Hendricks and Singhal 2000; Lee 2002; Mele and Colurcio 2006), some studies have not found any relationship between these TQM practices and financial performance (York and Miree 2004). In this respect, since the pioneering study by Flynn, Schroeder, and Sakakibara (1995), researchers have focused on the *organisational factors* enhancing the implementation of TQM for increased firm performance. For instance, Douglas and Judge (2001) investigated the direct impact of TQM on firms' financial performance, also incorporating organisational structure. Chin and Sofian (2011) developed a framework that integrates human capital and TQM, indicating a complementary role of both to enhance a firm's financial performance. Concurrently, researchers also suggested that learning-related practices and routines (e.g. OLC) can provide insights regarding how TQM contributes to improved financial performance (Terziovski et al. 2000; Linderman et al. 2004). OLC is defined as the organisational and managerial characteristics, practices, skills or factors that facilitate the organisational learning process (e.g. generating, acquiring, disseminating and integrating information/knowledge) and allow an organisation to learn (Jerez-Gomez, Cespedes-Lorente, and Valle-Cabera 2005). According to Jerez-Gomez, Cespedes-Lorente, and Valle-Cabera (2005), OLC involves four dimensions: managerial commitment, systems perspective, openness and experimentation, and knowledge transfer and integration. *Managerial commitment* indicates the development of managerial support for and leadership commitment to the learning process and employee motivation. *Systems perspective* refers to bringing the organisation's members together around a common identity and a shared vision, interconnecting the activities of employees, and developing relationships based on the exchange of information and shared mental models. *Openness and experimentation* denotes a climate of accepting new ideas and points of view and allowing individual knowledge to be constantly renewed, widened and improved through experimentation. *Knowledge transfer and integration* refers to the internal spreading of knowledge through verbal and non-verbal communication and the information systems.

In addition to OLC, business innovativeness is another critical factor to elevate the impact of TQM on a firm's financial performance. Business innovativeness refers to the creation and capture of new value not necessarily through product or process development projects (Kenedy 2007) but through the implementation of new methods in business practices, workplace organisation or external relations, and improvement and transformation of managerial mind-sets and business models to cope with changes (Martinez-Lorente, Dewhurst, and Dale 1999; Camison and Villar-Lopez 2010). As Robson and Kenchatt (2009) argued, business innovativeness is a wider form of innovation that may exist in conjunction with product and process innovation but that is an independent medium through which organisations

improve their competitive advantage. Here, business innovativeness is a system that takes a more holistic approach to the organisation to bring improvement to all of its operational areas and to organise the way people are managed and business is conducted.

3. Hypothesis development

3.1 *The relationship between TQM and OLC*

We suggest that TQM principles enable firms to capture, interpret, translate and deploy the knowledge, skills and attitudes of people throughout the organisation to establish a collective learning capability. For example, information or knowledge possessed by organisational members becomes collective or organisational-level knowledge through TQM practices such as continuous improvement (i.e. cooperation between organisational members and teamwork) and systems view (i.e. synthesising organisational knowledge as a whole, shared understanding) (Linderman et al. 2004). Kristal, Huang, and Schroeder (2010, 905) wrote that '[c]ontinuous improvement reflects an organisation's never-ending learning culture'. Also, firms continuously increase their knowledge accumulation and learning only if they follow a series of processes as a cycle: experimentation, reflection, generalisation and corrective action. Therefore:

H1: TQM is positively related to OLC.

3.2 *The relationship between TQM and business innovativeness*

We argue that TQM practices play a leveraging role on business innovativeness by promoting the active participation of people in the innovation processes (Miguel and Santiago 2010). Here, people engage in information and knowledge sharing, and cooperation, to consider alternative ways to manage tasks, identify outdated perceptions, and change and implement new business ideas (Luzon and Pasola 2011). Also, TQM practices create social groups or communities within and around the organisation that are driven by social bonds. This facilitates the transformation process of businesses due to complex relationships of reciprocity and feedback (Trigkas, Papadopoulos, and Karagouni 2012). Furthermore, TQM practices help firms to understand customers' needs, develop new market relationships and benchmark the business and customer solutions to customer-related problems. Those activities nurture the company's efforts to transform organisational practices, substitute existing corporate strategies with novel strategies and achieve improved forms of organisation. Hence, we hypothesise that:

H2: TQM is positively related to business innovativeness.

3.3 *The relationship between OLC and business innovativeness*

We contend that OLC supports a firm's business innovativeness by increasing employees' creativity and improving their knowledge explicitly through its dimensions: acquisition, dissemination and use of knowledge (Chiva and Alegre 2009). For instance, Hurley and Hult (1998) and Lemon and Sahota (2004) suggested that when employees/members of a group are encouraged to learn and to develop new ideas, they will favour the implementation of new organisational methods and business models and incorporate new organisational strategies. In addition, internal spreading of information/knowledge generated internally through communication and interaction among organisational members/functions, as well as its interpretation and integration, establishes the appropriate environment for the collective effort of business innovativeness (Jerez-Gomez, Cespedes-Lorente, and Valle-Cabera 2005). Next, firms adopting an OLC approach are better able to sense and exploit external opportunities and accordingly monitor and collect timely and accurate information as well as insights and new systems from outside firms so as to generate or transfer better management techniques and develop new business styles such as strategic partnerships, mergers or acquisitions (Alegre et al. 2012). Therefore:

H3: OLC is positively related to business innovativeness.

3.4 *The effects of TQM and OLC on a firm's financial performance*

The importance of organisational learning on a firm's financial performance has long been recognised in the literature (Ellinger et al. 2002). For instance, firms pursuing OLC that have the ability to foresee environmental and market changes are also willing to question and adjust their operational and managerial systems to achieve superior financial

performance (Calantone, Cavusgil, and Zhao 2002). Also, OLC incorporates a systems perspective, recognising the importance of bridging organisational members to collectively promote a common language, shared knowledge, joint action, and perceptions and beliefs. This results in the realisation of and increased effort in achieving organisational objectives to improve financial performance.

In addition to OLC, some studies have indicated a positive relationship between TQM implementation and a firm's financial performance through improved quality and reduced waste, increased customer satisfaction and loyalty, etc. (Kaynak 2003; Kumar et al. 2009). For instance, as TQM contributes to the reduction of process variance, the percentage of defective parts decreases and the production schedule flows more smoothly, thereby preventing future stoppages, which minimises losses in production output and sales (Flynn, Schroeder, and Sakakibara 1995). Accordingly, the need for extra 'safety' and cycle stock inventory decreases. Cycle times are also shortened due to the improvement of flows, reduction in set-up times and speeding up of product throughout.

We should also note that TQM influences the development of OLC. In this respect, we suggest that OLC mediates the relationship between TQM and firm's financial performance. Here, TQM practices, such as customer focus and process management, create a mutual trust and a knowledge-sharing culture among organisational members and leverage the impact of OLC on a firm's financial performance. Therefore:

H4: OLC positively mediates the relationship between TQM and a firm's financial performance.

3.5 *The effects of TQM and business innovativeness on a firm's financial performance*

The literature indicates that business innovativeness enhances a firm's financial performance. For instance, Sako (2012) suggested that novel ways of organising work, changes in management behaviour or business strategies, improved forms of organisation or new configurations of organisational structures are central in enabling business success and increased financial performance. Specifically, business innovativeness supports the development of a firm's core competencies and capabilities (Damanpour, Walker, and Avellaneda 2009). This way, the competencies a firm possesses and its skills, expertise, experience and the ability to act improve the firm's efficiency in detecting and utilising available resources; these competencies also foster the development of solutions to business problems and capture market-driven advantages (Habtay 2012) that directly translate into higher financial performance (Shahin 2011). Furthermore, substantial evidence in the literature indicates that business innovativeness facilitates the capitalisation of innovations through lowered production costs, reductions in delivery time and increased operational flexibility (Mol and Birkinshaw 2009).

It should also be noted that TQM affects business innovativeness and a firm's financial performance due to its customer-orientation principle (Reed, Lemak, and Montgomery 1996) and employee-focused approach (Prieto and Revilla 2006). This suggests that the relationship between TQM and financial performance can be explained by incorporating the mediating role of business innovativeness. For example, Prajogo and Sohal (2001) argued that TQM establishes a system and culture that provides a fertile environment for organisations to innovate and then increase their performance. Indeed, a greater cultural commitment to business innovativeness established through TQM will result in greater levels of performance. Therefore:

H5: Business innovativeness positively mediates the relationship between TQM and a firm's financial performance.

4. Research methods

4.1 *Measures and sampling*

To test the above hypotheses, multi-item scales are adopted from prior studies for the measurement of constructs (e.g. Samson and Terziovski 1999; Ellinger et al. 2002; Wang and Ahmed 2004; York and Miree 2004; Jerez-Gomez, Cespedes-Lorente, and Valle-Cabera 2005; Santos-Vijande and Álvarez-González 2007; Prajogo and Hong 2008). We measured TQM, OLC, business innovativeness and financial performance constructs using 5-point Likert scales ranging from 'strongly disagree' (1) to 'strongly agree' (5). The measures are included in the Appendix 1.

Although not the focus of our study, some variables, such as firm size, were included as control variables because they may have effects on the key variables in our study. Firm size was indicated by the logarithm of the employee number (Akgün, Keskin, and Byrne 2009). Additionally, previous research has suggested an effect of manufacturing types on business innovativeness (Damanpour 1992), performance (Miller and Roth 1994; Youndt et al. 1996) and learning. The manufacturing types were differentiated according to operational characteristics and classified as jobbing production, batch production and mass production following the study of Wild (1980).

After developing the question items, we adopted the parallel-translation method in developing the questionnaire in Turkish. Items were first translated from English into Turkish by one person and then back-translated into English by a second person. The two translators then jointly reconciled all differences. The suitability of the Turkish version of the questionnaires was then pre-tested by five part-time graduate students working in industry. Content validity was established through a revision of extant literature and through personal interviews with industry experts. These interviews confirmed that the questionnaire items were fully understandable.

The initial sample consisted of firms operating under International Standards Organisation and European quality standards in the industrial area of Turkey, near Istanbul. These firms were selected to guarantee the interest in quality management practices as well as familiarity with the issues addressed in the questionnaire. The questionnaire was mailed to the general manager or managing director of each organisation to ensure respondents' thorough knowledge of the firms' TQM practices and organisational culture and behaviour. The questionnaire delivery included a cover letter and a prepaid return envelope. The covering letter outlined the objectives and importance of the study. Empirical data were obtained through a random survey of managers, most of whom were middle/senior managers who had knowledge of past and present organisational practices relating to TQM and innovation. Of the 650 firms in a variety of sectors contacted, 460 agreed to participate in the survey study. Among these firms, we were able to gather usable data from 193 (42% response rate). Here, non-response bias was examined using the method suggested by Armstrong and Overton (1977). The adopted method tests for significant differences between early (i.e. those responses received before first follow-up letter) and late respondents (i.e. those received after first follow-up letter) by considering the late respondents a surrogate for non-respondents. Concurrently, the first 20 surveys received were compared to the last 20 received and the *t*-test using randomly selected measures was conducted, resulting in no significant difference between the two sets of responses. In our sample, the respondents were senior employees/staff members (44.04%), senior engineers (18.13%), technical leaders (6.22%), department managers (19.69%), product/project managers (1.55%), general managers (3.63%) and chief executive officers (6.74%). The number of employees in the responding firms was more than 2500 (22.28%), 1000–2499 (8.29%), 500–999 (6.22%), 250–499 (16.06%), 100–249 (17.62%) and less than 100 (29.53%). The age of the firms was over 50 (10.36%), 25–49 (19.69%), 10–24 (49.74%) and less than 10 (20.21%) years. The manufacturing types of the incorporating firms were mass production (21%), batch production (43.8%) and job production (35.2%).

4.2 *Construct validity and reliability*

After data collection, measures were subject to a data purification process to assess their unidimensionality, validity and reliability (Fornell and Larcker 1981). A CFA was performed by using AMOS 4.0 on each scale individually to assess the unidimensionality (Anderson and Gerbing 1988). Due to the sample-size constraint and the existence of many constructs, three different measurement models were evaluated. In this respect, the measures were divided into three subsets of theoretically related variables: TQM measures (i.e. leadership, strategic planning, customer focus, information technology and analysis, people management and process management), OLC measures (i.e. managerial commitment, systems perspective, openness and experimentation, and knowledge transfer and integration) and two outcome measures (i.e. business innovativeness and financial performance) as recommended by Akgün, Keskin, and Byrne (2009). After eliminating the problematic items in a step-by-step procedure, the CFA results indicated that three models fit adequately: the six TQM variables ($\chi^2_{(232)} = 399.37$, CFI = .93; RMSEA = .06), four OLC variables ($\chi^2_{(58)} = 101.85$, CFI = .96; RMSEA = .06) and two outcome variables ($\chi^2_{(8)} = 19.95$, CFI = .97; RMSEA = .09).

To assess discriminant validity, a series of two-factor CFA models, recommended by Bagozzi, Yi and Phillips (1991) were estimated in which individual factor correlations, one at a time, were restricted to unity. The fit of the restricted models was compared with that of the original model. In total, 110 models were evaluated. The chi-square change ($\Delta\chi^2$) in each model, constrained and unconstrained, were significant, $\Delta\chi^2 > 3.84$, which suggests that constructs demonstrate discriminant validity.

Furthermore, all 12 variables were included in one CFA model to establish convergent validity by confirming that all scale items loaded on their construct factors. The CFA produced a good fit with CFI of .88 (also, $\chi^2 = 1377.22$, $\chi^2/\text{df} = 1.75$, RMSEA = .06). In addition, all items loaded significantly on their respective constructs (with the lowest *t*-value being 2.50), providing support for convergent validity.

Finally, dimensionality of the higher order constructs of TQM and OLC was confirmed through second-order CFA. The loadings of the measurement items on the first-order factors, and the loadings of the first-order factors on the second-order factors, were all significant ($p < .05$). Furthermore, the fit indices exceeded their recommended thresholds (fit indices of second-order OLC construct were $\chi^2_{(30)} = 117.84$, CFI = .95; RMSEA = .07; and fit indices of second-order TQM construct were $\chi^2_{(54)} = 509.56$, CFI = .90; RMSEA = .07), indicating good model fits and a confirmation of scale dimensionality.

Table 1. Descriptive scales and construct correlation, and reliability estimates.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Process management	(.74)													
2. Leadership	.50**	(.73)												
3. Customer focus	.49**	.53**	(.74)											
4. Strategic planning	.56**	.41**	.35**	(.75)										
5. Information and analysis	.52**	.38**	.37**	.59**	(.74)									
6. People management	.56**	.49**	.46**	.57**	.62**	(.74)								
7. Managerial commitment	.41**	.52**	.56**	.42**	.32**	.50**	(.68)							
8. Systems perspective	.54**	.46**	.50**	.36**	.32**	.47**	.62**	(.74)						
9. Openness and experimentation	.27**	.35**	.43**	.22**	.14	.20**	.52**	.41**	(.72)					
10. Knowledge and integration	.31**	.40**	.37**	.23**	.29**	.37**	.55**	.46**	.45**	(.66)				
11. Business innovativeness	.58**	.60**	.55**	.52**	.50**	.64**	.61**	.59**	.31**	.47**	(.73)			
12. Firm financial performance	.19*	.32**	.32**	.31**	.36**	.29**	.23**	.19*	.11	.16*	.43**	(.75)		
13. Firm size (log)	.09	−.14	−.27	.21	.10	−.02	−.17	−.24	−.14	−.16	−.13	−.01	–	
14. Manufacturing type	−.03	−.12	−.14	.18	.05	−.01	−.09	−.18	−.04	−.05	−.12	.04	.64**	–
Composite reliability	.78	.78	.82	.83	.83	.83	.77	.78	.76	.68	.87	.90	NA	NA
Average variance ext.	.55	.54	.55	.56	.55	.55	.46	.55	.52	.43	.53	.56	NA	NA
Cronbach α	.84	.77	.82	.82	.83	.83	.75	.83	.76	.67	.87	.86	NA	NA

*$p < .05$, **$p < .01$.
Note: Diagonals show the square root of AVEs.

Table 1 shows the correlation among all 14 variables. The relatively moderate correlations provide further evidence of discriminant validity. Also, all reliability estimates, including SPSS 10.0-based coefficient alphas, average variance extracted (AVE) for each variable and AMOS 4.0-based composite reliabilities, are well beyond the threshold levels suggested by Fornell and Larcker (1981). Further, as suggested by Fornell and Larcker (1981), the squared root of AVE for each variable was greater than the latent factor correlations between pairs of variables, suggesting discriminant validity. The results indicate that measures are unidimensional and have adequate reliability and validity.

4.3 *Test of hypotheses*

We developed a SEM and used AMOS 4.0 to test our hypotheses. Maximum likelihood estimation methods were used, and the input for each analysis was the covariance matrix of the items. The model's goodness-of-fit was evaluated using absolute and relative indices. The absolute goodness-of-fit indices calculated were (a) the χ^2 goodness-of-fit statistic and (b) the root-mean-square error of approximation (RMSEA). The relative goodness-of-fit indices computed were (a) the comparative fit index (CFI) and (b) the incremental fit index (IFI).

During the analysis, similar with the studies of Prajogo and Sohal (2006) and Akgün et al. (2007), we treated the TQM as a second-order construct with six observable indicators (one corresponding to the mean value of each dimension of TQM) to reduce the complexity of our model. Similarly, we used the OLC as a second-order construct with four observable indicators (one corresponding to the mean value of each dimension of OLC). With regard to business innovativeness and firm financial performance variables, we treated them as latent variables.

Figure 1 shows that the SEM-based conceptual model adequately fits the data. The IFI and CFI were beyond .9, as suggested by Hatcher (1994). The ratio (χ^2/df) – χ^2 per degrees of freedom is 2.05, which is less than 5, suggesting a reasonable fit. The RMSEA is .07, very close to threshold level of .05.

Figure 1 provides compelling evidence of a positive and significant link between TQM and OLC ($\beta = .79$, $p < .01$), supporting H1. The results also indicate a positive and significant relationship between TQM and business innovativeness ($\beta = .71$, $p < .01$) and a significant relationship between OLC and business innovativeness ($\beta = .27$, $p < .05$), supporting H2 and H3.

Also, our results show that TQM explains 65% of variance in OLC; TQM and OLC explain 69% of variance in business innovativeness; and TQM, OLC, business innovativeness and control variables explain 28% of variance in a firm's financial performance.[1]

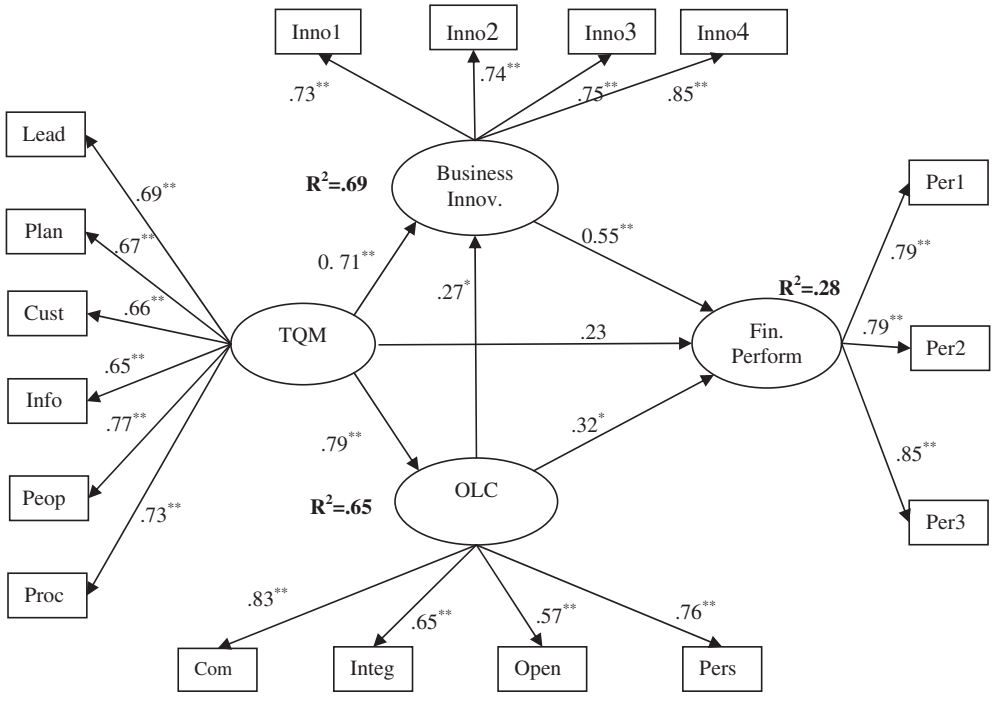

Figure 1. Results of SEM analysis.
Note: Path coefficients are standardised.
*$p < .05$, **$p < .01$.
$\chi^2 = 318.74$, df = 155, χ^2/df = 2.05, CFI = .92, IFI = .92, GFI = .87, RMSEA = .072.

To test the mediation effect, we built three different SEM models by using AMOS 4.0 as suggested by Little et al. (2007) and Kalchschmidt, Nieto, and Reiner (2010). We first verified the correlations between mediating variables and both TQM and financial performance. In this regard, as shown in Table 2, the correlation analysis provides evidence that necessary conditions for the mediation effects apply: both TQM and financial performance are correlated with business innovativeness and OLC.

In the first model, as shown in Table 3, we built the direct relationship model between TQM and financial performance. We found that TQM is significantly and positively related to financial performance ($\beta = .45$, $p < .01$). Also, model fit indices are $\chi^2_{(42)} = 116.59$, CFI = .90; RMSEA = .10.

In the second model, we tested the impact of TQM on OLC and business innovativeness. We found that TQM is significantly and positively related to OLC ($\beta = .81$, $p < .01$) and business innovativeness ($\beta = .84$, $p < .01$). Also, model fit indices are $\chi^2_{(89)} = 290.77$, CFI = .88; RMSEA = .11.

In the third model, we added the mediating variables (OLC and business innovativeness) to the relationship between TQM and financial performance. Based on the SEM analyses, we found that TQM is positively related to OLC ($\beta = .80$, $p < .01$) and business innovativeness ($\beta = .83$, $p < .01$). OLC and business innovativeness are positively related to financial performance ($\beta = .34$, $p < .01$) and ($\beta = .35$, $p < .05$), respectively. Of note, the relationship between TQM and financial performance vanishes ($\beta = .45$, $p > .1$) when we add OLC and business innovativeness to the model. Also, model fit indices are $\chi^2_{(159)} = 428.23$, CFI = .88; RMSEA = .10.

After the SEM analyses, we also used the Wald statistics to test the significance of interaction, as suggested by Little et al. (2007). As demonstrated in Table 4, we found that the indirect effect of TQM on financial performance via OLC is .25 and significant ($p < .05$). Also, the indirect effect of TQM on financial performance via business innovativeness is .39 and significant ($p < .1$). Therefore, we conclude that OLC and business innovativeness 'fully mediate' the effect of TQM on financial performance, supporting H4 and H5.

Table 2. Correlations analysis results.

Variables	1	2	3	4	5	6
1. TQM	–					
2. OLC	.75**	–				
3. Business innovativeness	.80**	.72**				
4. Firm financial performance	.45**	.27**	.43**			
5. Firm size (log)	−.03	−.11	−.13	−.01		
6. Manufacturing type	−.01	−.12	−.12	.04	.64**	

*$p < .05$, **$p < .01$.

Table 3. Results of mediating hypothesis.

Relationship	Model 1	Model 2	Model 3
TQM → Financial performance	.45**		.45
TQM → OLC		.81**	.80**
TQM → Business innovativeness		.84**	.83**
OLC → Financial performance			.34**
Business innovativeness → Financial performance			.35*
Firm size → Financial performance	−.04		−.08
Firm size → OLC		−.19*	−.19*
Firm size → Business innovativeness		−.02	−.02
Manufacturing type → Financial performance	.08		.11
Manufacturing type → OLC		.01	.01
Manufacturing type → Business innovativeness		−.07	−.07
Model fit indices	$\chi^2_{(42)} = 116.59$, CFI = .90, IFI = .90, χ^2/df = 2.78, RMSEA = .10	$\chi^2_{(89)} = 290.73$, CFI = .88, IFI = .89, χ^2/df = 3.27, RMSEA = .11	$\chi^2_{(159)} = 428.23$, CFI = .88, IFI = .88, χ^2/df = 2.69, RMSEA = .10

Note: Path coefficients are standardised.
*$p < .05$, **$p < .01$.

Table 4. Results of direct and indirect tests.

Independent variables	Mediation variables	Dependent variables	Mediation type	Direct effect	Indirect effect	Total effect
TQM	OLC	Financial performance	Full mediation	.23	.25	.48
TQM	Business innovativeness	Financial performance	Full mediation	.23	.39	.62

5. Discussion and implications

This paper empirically demonstrates that TQM enables organisations to build an organisational culture open and receptive to business innovativeness. Concurrently, TQM supports the ability of firms to learn by shaping corporate learning culture, supporting employees, teams and the organisation as a whole in creating and sharing relevant knowledge. Also, this paper has demonstrated that the increase in financial performance is not the direct consequence of TQM but rather of business innovativeness and OLC transferring the impact of TQM to financial performance. This finding contributes to the scholarly effort to investigate the mediating factors that synergistically act with TQM to construct a fertile environment for increased financial performance (Hendricks and Singhal 2000; Douglas and Judge 2001). For example, this finding leverages the research of Hendricks and Singhal (2000), indicating that the benefits provided by effective implementation of TQM on financial performance are contingent on firm characteristics. This finding also extends the research of Santos-Vijande and Álvarez-González (2007), providing empirical investigation regarding the relationship between TQM and business innovativeness by also including financial performance in this relationship. Our finding further presents empirical evidence to support Bou and Beltran's (2005) suggestion that successful implementation of TQM practices depends on collective learning to positively contribute to a firm's financial performance.

Next, this paper demonstrated that OLC fully mediates the relationship between TQM and business innovativeness. Here, consistent with Fink's (2007) argument, it appears essential for organisations to focus on managerial commitment, system perspective, openness and experimentation, and knowledge transfer and integration to achieve business innovativeness. Furthermore, our results reveal that, parallel to the study of Kober, Subramanniam, and Watson (2012), firm size and manufacturing type (e.g. being the risk factor in the industry) do not have any significant contribution to TQM's impact on financial performance, business innovativeness or OLC. This implies that regardless of firm size or whether the firm operates based on jobbing, batch or mass production, the management should seek to successfully implement TQM practices, together with a transformation in business logic and management thinking, as well as organisational capability to learn, to sustain improved financial output. On the other hand, these findings contradict the findings of Hendricks and Singhal (2000), suggesting that smaller firms already possess the factors for successful TQM implementation, thus favouring smaller firms. However, Hendricks and Singhal's (2000) research had as its domain public institutions that are larger than those considered small firms in our study.

In addition to the above contributions, we should also note some methodological limitations of this paper. Specifically, our research is prone to common method bias since in the questionnaire the dependent variable was answered by the same respondents who answered the independent variable in a cross-sectional manner. In addition, due to the nature of the data, the generalisability of sampling is another limitation of this study. The study was conducted in a specific national context, Turkish firms in general and the Istanbul district in particular. It is important to note that readers should be cautious when generalising the results to different cultural contexts.

6. Conclusion

This paper reveals that business innovativeness and OLC indirectly canalise TQM efforts with regard to financial performance. We believe that future researchers will find the area of TQM, organisational learning and business innovation a rich and fruitful area for exploration. For example, the concept of business innovativeness triggers the opportunity for future research. Additionally, the model presented in this study does not capture the alternative mediators that may influence the relationship between TQM and financial performance, such as product and technological innovativeness and their combined impact on firm operations. Furthermore, operational performance and organisational effectiveness can be investigated in addition to financial performance.

Note

1. We also tested the impact of manufacturing type on a firm's financial performance, business innovativeness, and OLC. Results show that manufacturing type has no significant impact on financial performance ($\beta = .11$, $p > .1$), business innovativeness ($\beta = -.08$, $p > .1$), or OLC ($\beta = .01$, $p > .1$).

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Appendix 1. Measures

*Factor loadings are shown in parentheses.

TQM practices (Adapted from Samson and Terziovski 1999; Santos-Vijande and Álvarez-González 2007; Prajogo and Hong 2008).

Process management

- We have clear, standardised and documented process instructions which are well understood by our employees. (.82)
- The concept of the 'internal customer' (i.e. the next process down the line) is well understood in our company. (.74)
- We design processes in our plant to be 'fool-proof' (preventive-oriented). (.65)
- We make extensive use of statistical techniques (e.g. SPC) to improve processes and to reduce variation. (.73)
- We use a supplier rating system to select our suppliers and monitor their performance. (.67)

Leadership

- Senior executives share similar beliefs about the future direction of this organisation. (.66)
- Senior managers actively encourage change and implement a culture of improvement, learning and innovation toward 'excellence'. (.81)
- Employees have the opportunity to share in and are encouraged to help the organisation implement changes. (.74)

Customer focus

- We actively and regularly seek customer input to identify their needs and expectations. (.87)
- Customer needs and expectations are effectively disseminated and understood throughout the workforce. (.87)
- We involve customers in our product design processes. (.56)
- We always maintain a close relationship with our customers and provide them an easy channel for communicating with us. (.62)

Strategic planning

- We have a mission statement which has been communicated throughout the company and is supported by our employees. (.74)
- We have a comprehensive and structured planning process which regularly sets and reviews short- and long-term goals. (.83)
- When we develop our plans, policies and objectives, we always incorporate the needs of all stakeholders, including the community. (.61)
- We have a written statement of strategy covering all business operations which is articulated and agreed by our senior manager. (.79)

Information and analysis

- We are engaged in an active competitive benchmarking programme to measure our performance against the 'best practice' in the industry. (.66)
- Our company has an effective performance measurement system to track overall organisational performance. (.80)
- Up-to-date data and information of the company's performance is always readily available for those who need it. (.73)
- Senior management regularly holds a meeting to review the company's performance and uses it as a basis for decision-making. (.78)

People management

- We have an organisation-wide training and development process, including career path planning, for all our employees. (.72)
- Our company has maintained both 'top-down' and 'bottom-up' communication processes. (.69)
- Employee satisfaction is formally and regularly measured. (.73)
- Employee flexibility, multi-skilling and training are actively used to support performance improvement. (.82)

OLC practices (Adapted from Jerez-Gomez, Cespedes-Lorente, and Valle-Cabera 2005)

Managerial Commitment

- Employee learning is considered more of an expense than an investment. (.63)
- The firm's management looks favourably on carrying out changes in any area to adapt to and/or stay ahead of new environmental situations. (.73)
- Employee learning capability is considered a key factor in this firm. (.74)
- In this firm, innovative ideas that work are rewarded. (.62)

Systems perspective

- All employees have generalised knowledge regarding this firm's objectives. (.65)
- All parts that make up this firm (departments, sections, work teams and individuals) are well aware of how they contribute to achieving the overall objectives. (.75)
- All parts that make up this firm are interconnected, working together in a coordinated fashion. (.83)

Openness and experimentation

- This firm promotes experimentation and innovation as a way to improve work processes. (.82)
- Experiences and ideas provided by external sources (advisors, customers, training firms, etc.) are considered a useful instrument for this firm's learning. (.64)
- Part of this firm's culture is that employees can express their opinions and make suggestions regarding the procedures and methods in place for carrying out tasks. (.71)

Knowledge transfer and integration

- Errors and failures are always discussed and analysed in this firm, on all levels. (.83)
- Employees have the chance to talk among themselves about new ideas, programmes and activities that might be of use to the firm. (.57)
- The firm has instruments (manuals, databases, files, organisational routines, etc.) that allow what has been learned in past situations to remain valid, although the employees are no longer the same. (.52)

Business Innovativeness (Adapted from Wang and Ahmed 2004)

- During the past five years, our company has developed many new management approaches. (.73)
- Management actively responds to the adaptation of 'new ways of doing things' by main competitors. (.74)
- We are willing to try new ways of doing things and seek unusual, novel solutions. (.75)
- We encourage people to think and behave in original and novel ways. (.85)

Firm financial performance (Adapted from Ellinger et al. 2002)
In comparison to our competitors, we have more:

- Return on investment. (.79)
- Gross margin (profitability/total sales). (.78)
- Earnings. (.89)